

## Economic Evaluation of Milk cake with different packaging materials

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### Abstract

The ten samples of milk cake were prepared with various combinations and levels of ingredients such as sugar, deshi ghee and coagulant. Out of these samples only top five of them were selected for the cost of production, on the basis of ten point hedonic scale. And then out of these top five combinations, the sample required highest cost for production was selected to estimate the cost of production by using the packaging materials. For P1, P4 and P5 samples, Rs. 91.47 for P3 and P8, within the process combinations it is seen that with increased level of deshi ghee, the cost proportionately increased (i.e. in P3 and P8 samples). The non-dairy product such as sugar and alum also play a very important role to reduce the cost and increase the profit. Sugar contributes about 140 gm of weight in one kg. of product and cost just Rs. 2.80 which helped to increase return from product because it is cheaper than the solids in the milk. The product sold in market at the rate of Rs. 110 per kg. which required net total cost for production about Rs. 79.54 and Rs. 82.04 without packaging material and with packaging material respectively.

**Keywords:** - Milk cake, cost of production, Polypropylene bag, Aluminium foil with LDPE laminates, Wax coated paper and Craft paper

### Introduction

The traditional Indian milk products have been receiving the increasing attention of the dairy communities both in India and abroad. Several government and private organizations have been conducting research on the mechanized and hygienic production as well as distribution of the indigenous milk products. Out of indigenous milk products khoa serves as an important base for delicious sweet meats like burfi, peda, gulabjamun, milk cake etc. the milk cake, a popular sweet in northern and central parts of India. A very few researchers Wagh, (2001) and Landge, S.N. (2006) standardized the method of manufacture of milk cake. But as a very popular indigenous milk product it was necessary to evaluate the cost of production. Using the various packaging materials found useful to increase the shelf life of product Landge, S.N. (2006). Traditionally this product getting the high return but it is not manufactured by maintaining proper hygienic condition standardized method and results to very low keeping quality. Hence present investigation was carried out by keeping view in mind that, to evaluate the cost of production of milk cake with and without the packaging materials to check their feasibility of cost of

production. Hence it will become beneficial to those manufacturers, which do not use packaging materials.

### Materials and Methods

The ten samples of milk cake were prepared by using the method described by Landge S.N. (2006) with various combinations and levels of ingredients such as sugar, deshi ghee and coagulant. Out of these samples only top five of them were selected for the cost of production, on the basis of ten point hedonic scale. And then out of these top five combinations, the sample required highest cost for production was selected to estimate the cost of production by using the packaging materials. For present investigation the different packaging materials were used such as polypropylene bag, aluminium foil with LDPE laminates, wax coated paper and craft paper with LDPE laminate. So in this way the cost of production of milk cake was estimated by using with and without packaging material. The cost of milk cake production was arrived at by calculating the price of different ingredient used at different levels e.g. Cost of milk, sugar, alum, deshi ghee, packaging material, fuel and miscellaneous charges were also considered. The

Table-1. Cost of production of milk cake ( per kg.)

Sr.No.	Particulars	Cost (Rs./kg)	Process combinations										C
			P1		P3		P4		P5		P8		
			Qty(g)	Amt	Qty(g)	Amt	Qty(g)	Amt	Qty(g)	Amt	Qty(g)	Amt	
1	Buffalo milk	19	3636	69.084	3636	69.084	3636	69.084	3636	69.084	3636	69.084	
2	Sugar	20	140	2.80	160	3.2	140	2.80	1.40	2.80	1.40	2.80	
3	Alum	16	0.083	0.0013	0.083	0.0013	0.2	0.0032	0.2	0.0032	0.30	0.0048	
4	Deshi ghee	150	3.0	0.46	5.0	0.76	3.0	0.46	4.0	0.46	4.0	0.54	
5	Fuel	-	-	5.5	-	5.5	-	5.5	-	5.5	-	5.5	
6	Miscellaneous	-	-	1.0	-	1.0	-	1.0	-	1.0	-	1.0	11.0
7	Cost (Rs./kg)	-	-	78.84	-	79.54	-	78.84	-	78.84	-	78.97	11.0

obtained data were analyzed using the simple statistical procedure i.e. Tabular analysis.

### Results and Discussion

**The cost of production of milk cake without packaging material:** The table no. 1 reveals that the cost of milk production would be vary depending on the ingredients combination used to the variable content of sugar, alum and deshi ghee. The lowest cost was obtained for P1, P4 and P5 process, being Rs. 78.44 per kg, whereas the cost P8 process was Rs. 78.97 and process P3 was Rs 79.54. The control sample i.e. C was sold at Rs. 110 per kg. It is important to note cost of milk and the cost of sugar. The contribution of alum to the cost was best. Miscellaneous charges taken as processing / working charges which contributes Rs. 1.0 per kg. The further look at the cost when deciding the profit level at 15 per cent, this resulted to Rs. 90.20 per kg., for P1,P4 and P5 samples, Rs. 91.47 for P3 and P8, within the process combinations it is seen that with increased level of deshi ghee, the cost proportionately increased (i.e. in P3 and P8 samples). Sugar is cheaper than the milk solids therefore the process combination P1 (12 per cent sugar) seemed to be having relatively lower cost (Rs.78.84). The result obtained during the present investigation corroborate with those of Shingade (1995), Dhanwade (2002), Wagh 2001), Khandagale (2003) and Khandare (2005).

**Cost of milk cake considering packaging material:** The Table No. 2 shows cost of production of milk cake

considering packaging materials. It is observed from the tables that when 250 g milk cake was packed in polypropylene bag (i.e.A4) and aluminium foil with laminates (A1) costs Rs. 20.17 and Rs. 20.57 respectively. With 15 percent profit margin it will cost up to Rs. 23.20 and Rs. 23.65 for A4 and A1 packaging materials respectively. When 500 g of milk cake was packed in A2 packaging material it required Rs. 47.15 and Rs 45.47 for A3 packaging materials comparing these values with control (C) sample with 15 per cent profit level, the net profit got Rs. 9.85 and 11.53 for A2 and A3 packaging materials respectively.

The cost incurred on wax coated paper A3 was at the highest in total cost of packaging material (3.40) followed by aluminium foil with LDPE laminates (2.50) craft paper with LDPE laminate (2.40) and polypropylene bag (1.20) for 1 kg of milk cake packaging. Polypropylene bag contribute to lowest cost but not good enough to increase shelf life of product. As such when calculated on the basis of 1 kg of milk preparation the expenses spent were in between Rs.78.84 to Rs.79.54 without packaging material and when packaging material used it costs around Rs. 80.74 to Rs.82.94 the rate of returned was determined around Rs. 35-42 per kg. The table no.2 indicates that as the quantity (in gms.) of product increased the cost of packaging material also increased and vice versa.

**Cost and return analysis:** Table no.3 shows such large profit generated from selling of 1 kg kilogram of product i.e. Rs.27.96 with packaging material. This

Table-2. Cost of production of milk cake considering packaging materials

Sr.No.	Qty(g)	Milk cake contained in packaging materials										C		
		A1			A2			A3			A4			
		C.M.	P.P.M.	T.C.	C.M.	P.P.M.	T.C.	C.M.	P.P.M.	T.C.	C.M.		P.P.M.	T.C.
1	100	7.95	0.30	8.25	7.95	0.25	8.20	7.95	0.50	8.45	7.95	0.15	8.10	11.40
2	250	19.87	0.70	20.57	19.87	0.45	20.32	19.87	1.15	21.02	19.87	0.30	20.17	28.50
3	500	39.75	1.30	41.05	39.75	1.25	41.00	39.75	2.40	42.15	39.75	0.65	40.4	57.00
4	1000	79.54	2.50	82.04	79.54	2.40	81.94	79.54	3.40	82.94	79.54	1.20	80.74	140.00
5	Total cost/kg	-	-	82.04	-	-	81.94	-	-	82.94	-	-	80.74	114

C.M. – Cost of milk, A1 - Aluminium foil with LDPE laminate, P.P.M. – Price of packaging material, A2 – Craft paper with LDPE laminate  
T.C. – Total cost, A3 - Wax coated paper, A4 – Polypropylene bag,

Table- 3. Cost and return analysis

Sr.No.	Particulars	Rs./kg.
1.	Market price of product	110.00
2.	Total cost of the production	79.54
3.	Net profit	30.46
4.	Cost of packaging material	2.50
5.	Net profit with packaging material	27.96

profit might be increased due to value added milk product i.e. deshi ghee. The non-dairy product such as sugar and alum also play a very important role to reduce the cost and increase the profit. Sugar contributes about 140 gm of weight in one kg. of product and cost just Rs.2.80 which helped to increase return from product because it is cheaper than the solids in the milk. The product sold in market at the rate of Rs. 110 per kg. which required net total cost for production about Rs.79.54 and Rs.82.04 without packaging material and with packaging material respectively.

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